Interim State Drought Management Plan March 14, 2008

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Tennessee Safe Drinking Water Act

68-221-702. Declaration of policy and purpose. — Recognizing that the waters of the state are the property of the state and are held in public trust for the benefit of its citizens, it is declared that the people of the state are beneficiaries of this trust and have a right to both an adequate quantity and quality of drinking water.

Other mandates:

- Water Quality (uses: aquatic life, assimilation of wastes, water supply, etc.)
- TVA and Corps – Navigation, Power (Hydro and thermal)
- Recreation (TDEC, TVA, Corps, et el)
- Agriculture (Forestry, Agricultural Products)

Interim State Drought Management Plan

- Developed in mid-eighties – agency names have changed, new laws
- Interim – Stop-gap Plan
- No Inter-agency or Public Involvement
- A focus on broad issues
- Did not proactively require drought management planning

What the Interim Drought Management Plan Does

Need for a Drought Management Plan based on mandates and water rights

Identifies and clarifies roles of local, state, federal and private sector

Advocates plans with phased responses:

- Normal conditions
- Alert
- Conservation
- Restrictions
- Emergency

What the Interim Drought Management Plan Does

Cont.

Factors in Risk Assessment

- Occurrence (Ground and Surface water)
- Reliability of source
- Variations in Demand (season, base)
- Priority Uses
- Water quality (taste and odor, etc)

http://state.tn.us/environment/dws/pdf/1987_IS_DroughtMgtPlan.pdf

Other Drought Management Resources

Local Drought Management Planning Guide for Public Water Suppliers (May 1988)

A guide to developing a public water system plan focusing on drought management

- Goals and Objectives in developing a plan
- Public Involvement
- Assessing Source Capacity
- Assessing Demand
- Identifying Management Trigger-points
- Classification of Water Users
- Water Shortages and WQ Problems (Pricing, etc.)
- Planning for Implementation (Public Education, Enforcement)

http://state.tn.us/environment/dws/pdf/1988_LocalDroughtMgtGuide_Pt1.pdf

Current Situation
2007-2008

Summer of 2007

- Excess Demand – exceeding treatment capacity, hydraulic capacity in some cases, exceeding source
- Declining Sources
- Failing Sources
- Water line breaks, Excessive Leaks (Unaccounted for water loss)
- Conservation, Restrictions and fear of failure
- Debate over reservoir operations
- Private wells, Springs and Ponds run dry

Summer 2007
Cont.

- Concern for aquatic life
- Livestock (sometimes resulting in additional demands on Public Water Suppliers)
- Nursery Industry, Landscaping and Sod Industry
- Golf Courses, (Greens and Fairways) Athletic Fields
- Water quality issues – temperature
- Conflicts between uses (livestock, recreation, drinking water, etc.)

Footnote

It could have been much worse…

Public water Systems (engineers, developers, systems officials) have:

- Interconnected and merged systems
- Sought more reliable sources
- Extended lines to impacted areas
- Pumped water upstream to protect aquatic life (temporary pumping schemes)
- Altered reservoir operations

Drought Mitigating Rules

1200-5-1-.05(9) – Where feasible require PWSs to interconnect

1200-5-1-.05(10) – Water Systems must plan for expansion when they reach 80% of design capacity

1200-5-1-.17(7) – CWSs must have an EOP (Emergency Operations Plan) – Many CWSs had Drought Management Plans. Some were reluctant to implement them.

1200-5-1-.17(9) - Minimum positive pressure of 20 psi throughout distribution system

1200-5-1-.17(14) – 24 hours of distribution storage based on average daily demand (or meet other requirements)

1200-5-1-.17(37) – Demonstrate viability (CD Rule)

What Underlies the Causes?

- Lack of Vision (failure to anticipate and plan)
- Failure to Communicate and Make Decisions in the best interest of consumers
- Lack of Resources (lack of funds to extend lines, obtain adequate sources, repair leaks, manage system)
- Institutional Constraints (Permit requirements, inflexibility, rules that address better management, require conservation, address interfaces with other water uses)

What were Missing Components?

- State Mandates – Guidance, Rules, Policy, Evaluative Tools
- Proactive solutions – Planning & Capital Improvements Budgets – Storage, Pump Stations, Line Sizes

Legislative Mandates focusing on drought management include:

HB 2669

SB 3613

HB 4209

The Task in Our Hands

WRTAC - Subgroup to assist TDEC in developing:

- **criteria**
- **rules**
- **guidance**

to be used in developing and evaluating drought management and conservation plans

Issues To be Addressed

Drought Management Planning and Water Resource Development are inter-related.

One is inside the other.

Issues To be Addressed

Cont.

Criteria used in developing drought management and conservation should recognize that “one size” does not fit all.

A good plan recognizes that sources, uses and disposition of water differ. Differences involve: vulnerability, diversity, reliability, and quality.

What is the measure of a source - 3Q20, pump test criteria, springflow or yield

The Best Solutions Must Recognize…

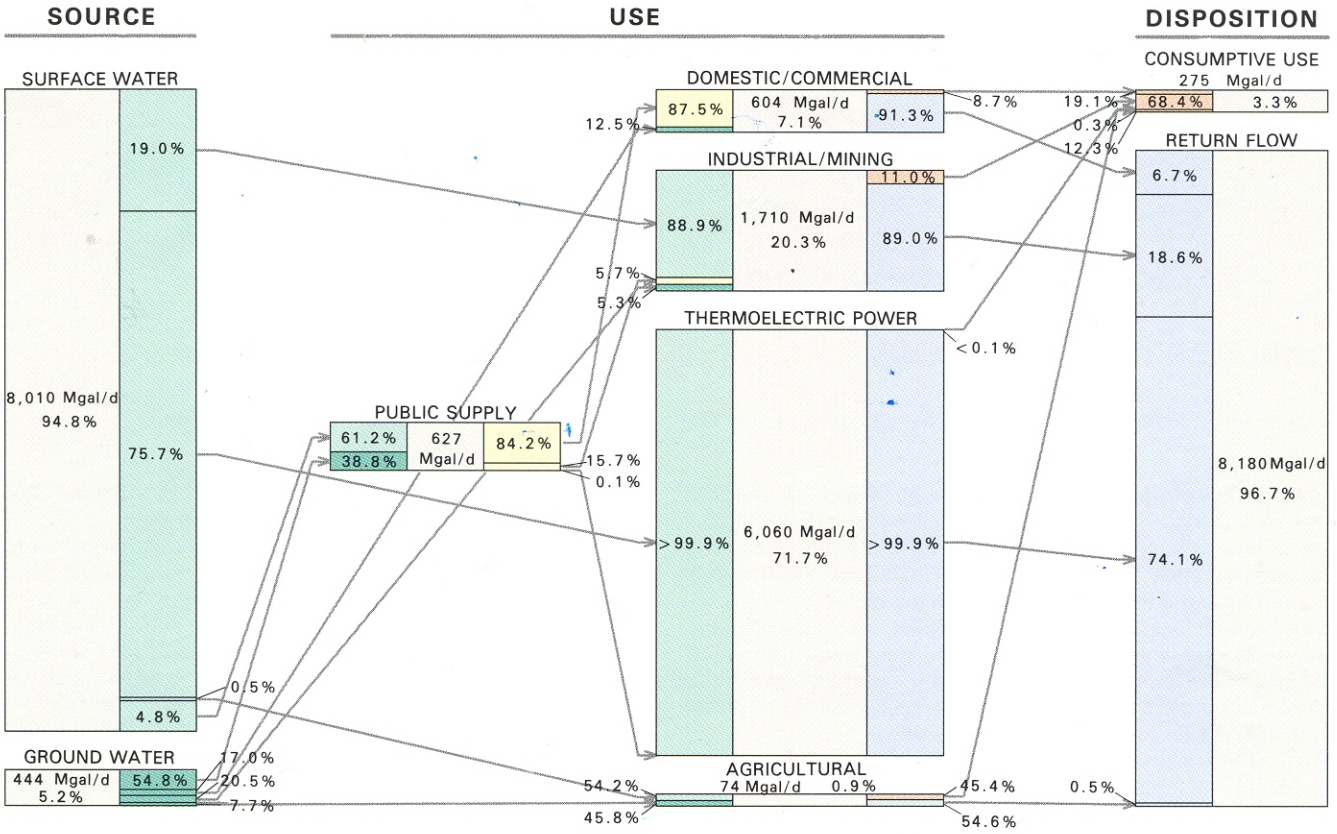

Figure 4. Source, use, and disposition of an estimated 8,450 Mgal/d (million gallons per day) of freshwater in Tennessee, 1985. Conveyance losses in public-supply distribution systems and some public water uses, such as fire fighting, are included in the total shown for domestic and commercial use; losses in irrigation distribution systems are included in the total shown for agricultural return flow. All numbers have been rounded and values may not add to totals. Percentages are rounded to the nearest one-tenth of 1 percent (0.1%) between 0.1 and 99.9 percent. Symbols: < means less than; > means greater than. (Source: Data from U.S. Geological Survey National Water Data Storage and Retrieval System.)

Issues To be Addressed

Cont.

- NPDES Permits that are flexible - protective of public health and the environment (quality and quantity) - Allowing for changes in discharge limits when requiring conservation by CWSs
- Anti-degradation Statement that is broad enough to protect public health
- Classification of Streams that do not exclude public water use when alternatives are impractical
- Drought-flexible reservoir operating guides
- Define water rights of agricultural and industrial users that share a source with a CWS

Issues To be Addressed
Cont.

Solutions may have water quality implications:

- Water Harvesting and deteriorating water quality
- Large storage tanks can lead to deteriorating water quality

Issues To be Addressed
Cont.

The benefits of Water Conservation may have unintended consequences. Benefits depend on the source and the receiving source.

- Unused treatment plant capacity could require higher rates. Water Systems need to sell water (up to their capacity). It pays the bills.

- Water Quality problems may result from lower demand, storage tank turnover, etc. requiring increased flushing

Issues To be Addressed
Cont.

The Benefits of Water Conservation vary:

- A greater beneficial impact on aquifers (such as the sands in West Tennessee) than on stream sources where water is returned to the source.

- Conservation benefits are greater when derived from lawn irrigation, agricultural irrigation, sod and nursery production and recreational uses (these include irrigation of golf course fairways, greens and athletic fields).

- Conservation can also conserve energy as well as reduce water treatment costs (plant size and chemical use)

The Task in Our Hands

WRTAC - Subgroup to assist TDEC in developing:

- **criteria**
- **rules**
- **guidance**

- **To be used in developing and evaluating drought management and conservation plans**
- **To be used in guiding WPC and DWS that might help to mitigate the impact of a severe drought**

Questions?
Comments?
Omissions?

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